

## WHAT IS CLAIMED IS:

1. A method for adjusting the emission rate of radiation of a source of radiation comprising:

the radiation emission rate of the source is calibrated as a function of a voltage applied between first and second emitting elements of the source and as a function of the heating current of the active source;

the second element is supplied with high voltage relative to the first element;

a heating current of the second element is adjusted for an expected rate of radiation emission as a function of the calibration; and

the calibration is carried out by an expression chosen to express the emission rate of radiation in which the logarithm of the value of the emission rate is a second-order polynomial function of the heating current and a first-order polynomial function of the voltage.

2. The method according to claim 1 wherein:

the source of radiation is an X-ray tube;

the first element is an anode of the tube; and

the second element is a cathode of the tube.

3. The method according to claim 2 wherein the tube is calibrated as a function of six coefficients a, b, c, d, e, and f that, for a given tube, satisfy the equation:

$$\ln(I_{\text{tube}}) = a I_{\text{ch}}^2 \ln(V) + b I_{\text{ch}}^2 + c I_{\text{ch}} \ln(V) + d I_{\text{ch}} + e \ln(V) + f,$$

where  $\ln$  is a Neperian logarithm;  $I_{\text{tube}}$  is tube current;  $I_{\text{ch}}$  is tube heating current; and  $V$  is tube voltage.

4. The method according to claim 2 wherein the coefficients a, b, c, d, e and f have values given by one of the columns of the following table, or values given by both columns of the following table for a dual-focus tube:

coefficients\cathode	wide focus	narrow focus
a	2.948793	4.517432
b	-7.42477	-11.1148
c	-8.01109	-10.6986
d	29.87146	37.45432
e	5.616099	6.544223
f	-23.3185	-25.8013

5. The method according to claim 2 comprising:

calibration of a particular tube is corrected as a function of the nature of this particular tube;

in making readings for this particular tube, during several calibration experiments, of measurements of the tube current, the heating current, and the applied high voltage; and

in carrying out a regression to determine coefficients  $\alpha$  and  $\beta$  with which a heating current  $I_{chreal}$  to be applied to the tube is expressed in the form:  $I_{chreal} = \alpha \cdot I_{chcalib} + \beta$ , the form in which  $I_{chcalib}$  is the value of the heating current such as it results from the calibration.

6. The method according to claim 3 comprising:

calibration of a particular tube is corrected as a function of the nature of this particular tube;

in making readings for this particular tube, during several calibration experiments, of measurements of the tube current, the heating current, and the applied high voltage; and

in carrying out a regression to determine coefficients  $\alpha$  and  $\beta$  with which a heating current  $I_{chreal}$  to be applied to the tube is expressed in the form:  $I_{chreal} = \alpha \cdot I_{chcalib} + \beta$ , the form in which  $I_{chcalib}$  is the value of the heating current such as it results from the calibration.

7. The method according to claim 4 comprising:

calibration of a particular tube is corrected as a function of the nature of this particular tube;

in making readings for this particular tube, during several calibration experiments, of measurements of the tube current, the heating current, and the applied high voltage; and

in carrying out a regression to determine coefficients  $\alpha$  and  $\beta$  with which a heating current  $I_{chreal}$  to be applied to the tube is expressed in the form:  $I_{chreal} = \alpha \cdot I_{chcalib} + \beta$ , the form in which  $I_{chcalib}$  is the value of the heating current such as it results from the calibration.

8. The method according to claim 2 comprising:

calibration of a particular tube is corrected as a function of the aging of this particular tube;

in making readings for this particular tube, during subsequent uses, of measurements of the tube current  $I_{tube}$ , the heating current  $I_{ch}$ , and the applied high voltage  $V$ ; and

in carrying out a regression to determine coefficients  $\alpha$  and  $\beta$  with which the heating current  $I_{chreal}$  to be applied to the tube is expressed in the form:  $I_{chreal} = \alpha \cdot I_{chcalib} + \beta$ , the form in which  $I_{chcalib}$  is the value of the heating current such as it results from the calibration.

9. The method according to claim 3 comprising:

calibration of a particular tube is corrected as a function of the aging of this particular tube;

in making readings for this particular tube, during subsequent uses, of measurements of the tube current  $I_{tube}$ , the heating current  $I_{ch}$ , and the applied high voltage  $V$ ; and

in carrying out a regression to determine coefficients  $\alpha$  and  $\beta$  with which the heating current  $I_{chreal}$  to be applied to the tube is expressed in the form:  $I_{chreal} = \alpha \cdot I_{chcalib} + \beta$ , the form in which  $I_{chcalib}$  is the value of the heating current such as it results from the calibration.

10. The method according to claim 4 comprising:

calibration of a particular tube is corrected as a function of the aging of this particular tube;

in making readings for this particular tube, during subsequent uses, of measurements of the tube current  $I_{\text{tube}}$ , the heating current  $I_{\text{ch}}$ , and the applied high voltage  $V$ ; and

in carrying out a regression to determine coefficients  $\alpha$  and  $\beta$  with which the heating current  $I_{\text{chreal}}$  to be applied to the tube is expressed in the form:  $I_{\text{chreal}} = \alpha \cdot I_{\text{chcalib}} + \beta$ , the form in which  $I_{\text{chcalib}}$  is the value of the heating current such as it results from the calibration.

11. The method according to claim 5 comprising:

calibration of a particular tube is corrected as a function of the aging of this particular tube;

in making readings for this particular tube, during subsequent uses, of measurements of the tube current  $I_{\text{tube}}$ , the heating current  $I_{\text{ch}}$ , and the applied high voltage  $V$ ; and

in carrying out a regression to determine coefficients  $\alpha$  and  $\beta$  with which the heating current  $I_{\text{chreal}}$  to be applied to the tube is expressed in the form:  $I_{\text{chreal}} = \alpha \cdot I_{\text{chcalib}} + \beta$ , the form in which  $I_{\text{chcalib}}$  is the value of the heating current such as it results from the calibration.

12. A computer program product having therein a program code comprising:

the radiation emission rate of the source is calibrated as a function of a voltage applied between first and second emitting elements of the source and as a function of the heating current of the active source;

the second element is supplied with high voltage relative to the first element;

a heating current of the second element is adjusted for an expected rate of radiation emission as a function of the calibration; and

the calibration is carried out by an expression chosen to express the emission rate of radiation in which the logarithm of the value of the emission rate is a second-

order polynomial function of the heating current and a first-order polynomial function of the voltage.

13. A data carrier comprising a medium having embedded therein a computer program code comprising:

the radiation emission rate of the source is calibrated as a function of a voltage applied between first and second emitting elements of the source and as a function of the heating current of the active source;

the second element is supplied with high voltage relative to the first element;

a heating current of the second element is adjusted for an expected rate of radiation emission as a function of the calibration; and

the calibration is carried out by an expression chosen to express the emission rate of radiation in which the logarithm of the value of the emission rate is a second-order polynomial function of the heating current and a first-order polynomial function of the voltage.